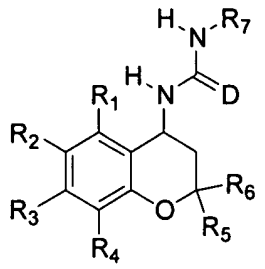
IN THE CLAIMS

Claim 1 (original): Benzopyran derivatives of the general formula



(I)

wherein :

D represents S or O;

R_1, R_2, R_3 and R_4 are independently hydrogen, halogen, C_{1-6}-alkyl, C_{3-8}-cycloalkyl, hydroxy, C_{1-6}-alkoxy, C_{1-6}-alkoxy-C_{1-6}-alkyl, nitro, amino, cyano, cyanomethyl, perhalomethyl, C_{1-6}-monoalkyl- or dialkylamino, sulfamoyl, C_{1-6}-alkylthio, C_{1-6}-alkylsulfonyl, C_{1-6}-alkylsulfinyl, formyl, C_{1-6}-alkylcarbonylamino, R_8arylthio, R_8arylsulfinyl, R_8arylsulfonyl, C_{1-6}-alkoxycarbonyl, C_{1-6}-alkoxycarbonyl-C_{1-6}-alkyl, carbamoyl, carbamoylmethyl, C_{1-6}-monoalkyl- or dialkylaminocarbonyl, C_{1-6}-monoalkyl- or dialkylaminothiocarbonyl, ureido, C_{1-6}-monoalkyl- or dialkylaminocarbonylamino, thioureido, C_{1-6}-monoalkyl- or dialkylaminothiocarbonylamino, C_{1-6}-monoalkyl- or dialkylaminosulfonyl, carboxy, carboxy-C_{1-6}-alkyl, acyl, R_8aryl, R_8aryl-C_{1-6}-alkyl, R_8aryloxy;

R_5 and R_6 are each independently hydrogen, C_{1-6}-alkyl or, R_5 and R_6 taken together with the carbon atom to which they are attached form a 3- to 6- membered carbocyclic ring;

R_7 is 2-, 3- or 4-pyridyl optionally mono- or polysubstituted by R_1 or

R_7 is 2- or 3-thienyl optionally mono- or polysubstituted substituted by R_1 or

R_7 is phenyl mono- or polysubstituted by R_1 with the exception of R_7 representing C_6H_5;

R_8 is hydrogen, halogen, C_{1-6}-alkyl, C_{3-8}-cycloalkyl, hydroxy, C_{1-6}-alkoxy, nitro, amino, cyano, cyanomethyl, perhalomethyl;

or a salt thereof with a pharmaceutically acceptable acid or base, or any optical isomer or mixture of optical isomers, including a racemic mixture or any polymorphic and tautomeric form.

Claim 2 (currently amended): ~~A~~ The benzopyran derivative according to claim 1 wherein D represents S.

Claim 3 (currently amended): ~~A~~ The benzopyran derivative according to claim 1 ~~or 2~~ selected from :

R/S-4-(3-Chlorophenylaminothiocarbonylamino)-3,4-dihydro-2,2-dimethyl-6-fluoro-2*H*-1-benzopyran,

R/S-6-Chloro-4-(3-chlorophenylaminothiocarbonylamino)-3,4-dihydro-2,2-dimethyl-2*H*-1-benzopyran,

R/S-4-(4-Chlorophenylaminothiocarbonylamino)-3,4-dihydro-2,2-dimethyl-6-fluoro-2*H*-1-benzopyran,

R/S-6-Chloro-4-(4-chlorophenylaminothiocarbonylamino)-3,4-dihydro-2,2-dimethy-2*H*-1-benzopyran,

R/S-6-Bromo-4-(4-chlorophenylaminothiocarbonylamino)-3,4-dihydro-2,2-dimethyl-2*H*-1-benzopyran,

R/S-4-(3-Cyanophenylaminothiocarbonylamino)-3,4-dihydro-2,2-dimethyl-6-fluoro-2*H*-1-benzopyran,

R/S-6-Chloro-4-(3-cyanophenylaminothiocarbonylamino)-3,4-dihydro-

2,2-dimethyl-2*H*-1-benzopyran,
R/S-6-Bromo-4-(3-cyanophenylaminothiocarbonylamino)-3,4-dihydro-2,2-dimethyl-2*H*-1-benzopyran,
R/S-4-(4-Cyanophenylaminothiocarbonylamino)-3,4-dihydro-2,2-dimethyl-6-fluoro-2*H*-1-benzopyran,
R/S-6-Chloro-4-(4-cyanophenylaminothiocarbonylamino)-3,4-dihydro-2,2-dimethyl-2*H*-1-benzopyran,
R/S-6-Bromo-4-(4-cyanophenylaminothiocarbonylamino)-3,4-dihydro-2,2-dimethyl-2*H*-1-benzopyran,
R/S-6-Chloro-3,4-dihydro-2,2-dimethyl-4-(3-nitrophenylaminothiocarbonylamino)-2*H*-1-benzopyran,
R/S-6-Bromo-3,4-dihydro-2,2-dimethyl-4-(3-nitrophenylaminothiocarbonylamino)-2*H*-1-benzopyran,
R/S-3,4-Dihydro-2,2-dimethyl-6-fluoro-4-(4-nitrophenylaminothiocarbonylamino)-2*H*-1-benzopyran,
R/S-6-Chloro-3,4-dihydro-2,2-dimethyl-4-(4-nitrophenylaminothiocarbonylamino)-2*H*-1-benzopyran,
R/S-4-(3-Chlorophenylaminothiocarbonylamino)-3,4-dihydro-2,2-dimethyl-6-fluoro-2*H*-1-benzopyran,
R/S-6-Chloro-4-(3-chlorophenylaminothiocarbonylamino)-3,4-dihydro-2,2-dimethyl-2*H*-1-benzopyran,
R/S-4-(4-Chlorophenylaminothiocarbonylamino)-3,4-dihydro-2,2-dimethyl-6-fluoro-2*H*-1-benzopyran,
R/S-6-Chloro-4-(4-chlorophenylaminothiocarbonylamino)-3,4-dihydro-2,2-dimethy-2*H*-1-benzopyran,
R/S-6-Bromo-4-(4-chlorophenylaminothiocarbonylamino)-3,4-dihydro-2,2-dimethyl-2*H*-1-benzopyran,
R/S-4-(3-Cyanophenylaminothiocarbonylamino)-3,4-dihydro-2,2-dimethyl-6-fluoro-2*H*-1-benzopyran,
R/S-6-Chloro-4-(3-cyanophenylaminothiocarbonylamino)-3,4-dihydro-2,2-dimethyl-2*H*-1-benzopyran,
R/S-6-Bromo-4-(3-cyanophenylaminothiocarbonylamino)-3,4-dihydro-2,2-dimethyl-2*H*-1-benzopyran,

R/S-4-(4-Cyanophenylaminothiocarbonylamino)-3,4-dihydro-2,2-dimethyl-6-fluoro-2*H*-1-benzopyran,
R/S-6-Chloro-4-(4-cyanophenylaminothiocarbonylamino)-3,4-dihydro-2,2-dimethyl-2*H*-1-benzopyran,
R/S-6-Bromo-4-(4-cyanophenylaminothiocarbonylamino)-3,4-dihydro-2,2-dimethyl-2*H*-1-benzopyran,
R/S-6-Chloro-3,4-dihydro-2,2-dimethyl-4-(3-nitrophenylaminothiocarbonylamino)-2*H*-1-benzopyran,
R/S-6-Bromo-3,4-dihydro-2,2-dimethyl-4-(3-nitrophenylaminothiocarbonylamino)-2*H*-1-benzopyran,
R/S-3,4-Dihydro-2,2-dimethyl-6-fluoro-4-(4-nitrophenylaminothiocarbonylamino)-2*H*-1-benzopyran,
R/S-6-Chloro-3,4-dihydro-2,2-dimethyl-4-(4-nitrophenylaminothiocarbonylamino)-2*H*-1-benzopyran,
R/S-6-Bromo-3,4-dihydro-2,2-dimethyl-4-(4-nitrophenylaminothiocarbonylamino)-2*H*-1-benzopyran,
R/S-6-Bromo-3,4-dihydro-2,2-dimethyl-4-(4-nitrophenylaminothiocarbonylamino)-2*H*-1-benzopyran,
R/S-6-Bromo-3,4-dihydro-2,2-dimethyl-4-(3-trifluoromethylphenylaminothiocarbonylamino)-2*H*-1-benzopyran,
R/S-6-Chloro-3,4-dihydro-2,2-dimethyl-4-(2-methoxyphenylaminocarbonylamino)-2*H*-1-benzopyran,
R/S-6-Bromo-3,4-dihydro-2,2-dimethyl-4-(2-methoxyphenylaminocarbonylamino)-2*H*-1-benzopyran,
R/S-3,4-Dihydro-2,2-dimethyl-6-fluoro-4-(3-methoxyphenylaminocarbonylamino)-2*H*-1-benzopyran,
R/S-6-Chloro-3,4-dihydro-2,2-dimethyl-4-(3-methoxyphenylaminocarbonylamino)-2*H*-1-benzopyran,
R/S-6-Bromo-3,4-dihydro-2,2-dimethyl-4-(3-methoxyphenylaminocarbonylamino)-2*H*-1-benzopyran,
R/S-3,4-Dihydro-2,2-dimethyl-6-fluoro-4-(4-methoxyphenylaminocarbonylamino)-2*H*-1-benzopyran,
R/S-6-Chloro-3,4-dihydro-2,2-dimethyl-4-(4-

methoxyphenylaminocarbonylamino)-2*H*-1-benzopyran,
R/S-6-Bromo-3,4-dihydro-2,2-dimethyl-4-(4-
methoxyphenylaminocarbonylamino)-2*H*-1-benzopyran,
R/S-3,4-Dihydro-2,2-dimethyl-6-fluoro-4-(2-
methylphenylaminocarbonylamino)-2*H*-1-benzopyran,
R/S-6-Chloro-3,4-dihydro-2,2-dimethyl-4-(2-
methylphenylaminocarbonylamino)-2*H*-1-benzopyran,
R/S-6-Bromo-3,4-dihydro-2,2-dimethyl-4-(2-
methylphenylaminocarbonylamino)-2*H*-1-benzopyran,
R/S-3,4-Dihydro-2,2-dimethyl-6-fluoro-4-(3-
methylphenylaminocarbonylamino)-2*H*-1-benzopyran,
R/S-6-Chloro-3,4-dihydro-2,2-dimethyl-4-(3-
methylphenylaminocarbonylamino)-2*H*-1-benzopyran,
R/S-6-Bromo-3,4-dihydro-2,2-dimethyl-4-(3-
methylphenylaminocarbonylamino)-2*H*-1-benzopyran,
R/S-3,4-Dihydro-2,2-dimethyl-6-fluoro-4-(4-
methylphenylaminocarbonylamino)-2*H*-1-benzopyran,
R/S-6-Chloro-3,4-dihydro-2,2-dimethyl-4-(4-
methylphenylaminocarbonylamino)-2*H*-1-benzopyran,
R/S-6-Bromo-3,4-dihydro-2,2-dimethyl-4-(4-
methylphenylaminocarbonylamino)-2*H*-1-benzopyran,
R/S-4-(2-Chlorophenylaminocarbonylamino)-3,4-dihydro-2,2-dimethyl-
6-fluoro-2*H*-1-benzopyran,
R/S-6-Chloro-4-(2-chlorophenylaminocarbonylamino)-3,4-dihydro-2,2-
dimethyl-2*H*-1-benzopyran,
R/S-6-Bromo-4-(2-chlorophenylaminocarbonylamino)-3,4-dihydro-2,2-
dimethyl-2*H*-1-benzopyran,
R/S-4-(3-Chlorophenylaminocarbonylamino)-3,4-dihydro-2,2-dimethyl-
6-fluoro-2*H*-1-benzopyran,
R/S-6-Chloro-4-(3-chlorophenylaminocarbonylamino)-3,4-dihydro-2,2-
dimethyl-2*H*-1-benzopyran,
R/S-6-Bromo-4-(3-chlorophenylaminocarbonylamino)-3,4-dihydro-2,2-
dimethyl-2*H*-1-benzopyran,

R/S-4-(4-Chlorophenylaminocarbonylamino)-3,4-dihydro-2,2-dimethyl-6-fluoro-2*H*-1-benzopyran,
R/S-6-Chloro-4-(4-chlorophenylaminocarbonylamino)-3,4-dihydro-2,2-dimethyl-2*H*-1-benzopyran,
R/S-6-Bromo-4-(4-chlorophenylaminocarbonylamino)-3,4-dihydro-2,2-dimethyl-2*H*-1-benzopyran.

Claim 4 (currently amended): ~~Benzopyran~~ The benzopyran derivatives according to claim 1 ~~any one of the preceding claims~~ for use as openers of the K_{ATP}-regulated potassium channels.

Claim 5 (currently amended): ~~A~~ The pharmaceutical composition comprising a benzopyran derivative according to claim 1 ~~any one of the preceding claims~~ or pharmaceutically acceptable salt thereof with a pharmaceutically acceptable acid or base or any optical isomer or mixture of optical isomers, including a recemic mixture or any tautomeric form together with one or more pharmaceutically acceptable carriers of diluents.

Claim 6 (currently amended): ~~A~~ The pharmaceutical composition for use in the treatment of diseases of the endocrinogical system such as hyperinsulinaemia and diabetes comprising a benzopyran derivative according to claim 1 ~~any one of the preceding benzopyran derivative claims~~ or a pharmaceutical acceptable salt thereof with a pharmaceutically acceptable acid or base, or any optical isomer or mixture of optical isomers, including a racemic mixture, or any tautomeric from together with a pharmaceutically acceptable carrier or diluent.

Claim 7 (currently amended): The pharmaceutical composition according to claim 5 ~~any one of the claims 5 or 6~~ in the form of an oral dosage unit or parental dosage unit.

Claim 8 (currently amended): ~~A~~ The pharmaceutical composition

according to claim 5 ~~any one of the claims 5 or 6~~ wherein said benzopyran derivative is administered as a dose in a range from about 0.05 to 1000, preferably from about 0.1 to 500 and especially in the range from 50 to 200 mg per day.

Claim 9 (currently amended): ~~A~~ The benzopyran derivative according to claim 1 ~~any one of the preceding benzopyran derivative claims~~ or a pharmaceutically acceptable salt thereof with a pharmaceutically acceptable acid or base, or any optical isomer or mixture of optical isomers, including a racemic mixture, or any tautomeric form for therapeutical use.

Claim 10 (currently amended): ~~A~~ The benzopyran derivative according to claim 1 ~~any one of the preceding benzopyran derivative claims~~ or a pharmaceutically acceptable salt thereof with a pharmaceutically acceptable acid or base, or any optical isomer or mixture of optical isomers, including a racemic mixture, or any tautomeric form for therapeutical use in then treatment of diseases of the endocrinological system, such as hyperinsulinaemia and diabetes.

Claim 11 (currently amended): The use of a benzopyran derivative according to claim 1 ~~any one of the preceding compound claims~~ or a pharmaceutically acceptable salt thereof with a pharmaceutically acceptable acid or base, or any optical isomer or mixture of optical isomers, including a racemic mixture, or any tautomeric form as a medicament.

Claim 12 (currently amended): The use of a benzopyran derivative according to claim 1 ~~any of the preceding compound claims~~ for preparing a medicament.

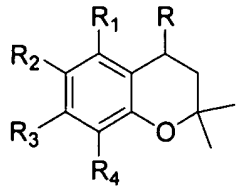
Claim 13 (currently amended): The use of a benzopyran derivative according to claim 1 ~~any one of the preceding benzopyran derivative claims~~ or a pharmaceutically acceptable salt thereof with a

pharmaceutically acceptable acid or base, or any optical isomer or mixture of optical isomers, including a racemic mixture, or any tautomeric form for the preparation of a medicament for the treatment of diseases of the endocrinological system, such as hyperinsulinaemia and diabetes.

Claim 14 (currently amended): ~~A~~ The method of treating diseases of the endocrinological system, such as hyperinsulinaemia and diabetes in a subject in need thereof comprising administering an effective amount of a benzopyran derivative according to claim 1 ~~any one of the preceding benzopyran derivative claims to said subject~~.

Claim 15 (currently amended): ~~A~~ The process for the manufacture of a medicament, particular to be ~~use~~ used in the treatment of diseases of the endocrinological system, such as hyperinsulinaemia and diabetes which process comprising bringing a compound of formula (I) according to claim 1 ~~any one of the preceding compound claims 1~~ or a pharmaceutically acceptable salt thereof into a galenic dosage form.

Claim 16 (original): A method of preparing a benzopyran derivative of formula (I) which comprises :
- reacting a compound of formula (II)



(II)

wherein R represents NH_2 and R_1, R_2, R_3 and R_4 are defined as for formula (I) with an isothiocyanante of formula (III)

R_7-N=C=D

(III)

wherein D represents S or O and R_7 is defined as for formula (I), to form a benzopyran derivative of formula (I); or

- reacting a compound of formula (II) wherein R represents -N=C=S and R_1, R_2, R_3 and R_4 are defined as for formula (I) with an amine of formula (IV)

$$R_7\text{-}NH_2$$

(IV)

wherein R_7 is defined as for formula (I), to form a benzopyran derivative of formula (I).